Amendments to the Claims:

This listing of claims will replace all prior version, and listings, of claims in the application. Where claims have been amended and/or canceled, such amendments and/or cancellations are done without prejudice and/or waiver and/or disclaimer to the claimed and/or disclosed subject matter, and the applicant and/or assignee reserves the right to claim this subject matter and/or other disclosed subject matter in a continuing application.

Listing of the claims:

1. (Original) A method of operating a radio frequency (RF) signal processing circuit comprising the steps of: a. establishing a wireless communications channel between a first access point and a second access point in accordance with a communications protocol; b. monitoring transmission conditions in said wireless communications channel, including an available data rate, to determine whether a first transmission mode or a second transmission mode should be used; c. performing a first set of signal processing operations at said first access point on a single received RF signal from said second access point when said first transmission mode is used; d. performing a second set of signal processing operations at said first access point on M independent RF received signals from said second access point when said second mode of operation is used; wherein data transmissions between said first access point and said second access point are compliant with said communications protocol in both said first transmission mode and said second transmission mode.

2. (Original)The method of claim 1, wherein said second mode is automatically enabled when transmission conditions indicate that a data rate in said channel has fallen below a predetermined threshold.

3. (Original) The method of claim 1, wherein said second mode is automatically enabled when transmission conditions indicate that a data rate in said channel is to be enhanced above a nominal operating rate.

4. (Original) The method of claim 1, wherein said communications protocol is based on an 802.11x communications protocol.

5. (Original) The method of claim 1 wherein said second set of signal processing operations introduce a latency, and said latency is compensated using a dummy data response to maintain compatibility with said communications protocol.

6. (Original) The method of claim 1 wherein said second set of signal processing operations is performed by a multiple-in, multiple out (MIMO) processor.

7. (Original) A method of performing multi-antenna radio frequency (RF) communications comprising the steps of: performing data transmissions during a first operating mode in a channel at a first access point using a first baseband processor; performing data transmissions during a second operating mode in said channel at said first access point using a multi-antenna signal processing circuit, including the following steps: (a) receiving M independent RF modulated input signals from a second access point; (b) processing said M independent RF modulated input signals using a channel mixing matrix to extract N independent data signals transmitted by said second access point; wherein said first operating mode and said second operating mode are automatically selected based on a transmission condition in said channel.

8. (Original The method of claim 7, wherein said multi-antenna signal processing circuit processes at least 4 separate input signals.

9. (Original) The method of claim 7, further including a step of using a channel mixing matrix to perform an operation that computes a recovered data signal x as follows: x=b1*y1+b2*y2+x0 where b1 and b2 are equalization coefficients computed by said multi-antenna signal processing circuit, y1 and y2 are received data from separate baseband channels, and x0 is a recovered signal from an adjacent channel.

10. (Original) The method of claim 7, wherein space division multiple access is realized by separating different RF signals from different directions simultaneously in the multi-antenna signal processing circuit.

11. (Original) The method of claim 7, wherein said multi-antenna signal processing circuit extends a data transmission range achieved by said baseband processor circuit between said first access point and said second access point.

12. (Original) The method of claim 7, wherein said multi-antenna signal processing circuit increases a data transmission rate achieved by said baseband processor circuit between said first access point and said second access point.

13. (Original) The method of claim 7, wherein said multi-antenna signal processing circuit transmits M separate data signals to said second access point.

14. (Original) The method of claim 13, wherein a localized encryption is achieved for said second access point by independently controlling said M separate transmission signals.

15. (Original) A method of transmitting and receiving data in a 802.11x compatible communications channel using a plurality of radio frequency (RF) received signals comprising the steps of: (a) operating a first baseband processor to handle data transmissions in a first mode between a first access point

and a second access point in accordance with an 802.11x protocol, based on a first channel transmission condition; (b) operating a multi-signal processor to handle data transmissions in a second mode between said first access point and said second access point in accordance with an 802.11x protocol under a second channel transmission condition, during which time said multi-signal processor: i) receives M independent RF modulated input signals from said second access point; ii) processes said M independent RF modulated input signals using a channel mixing matrix to extract N independent data signals transmitted by said second access point; (c) transmiting an RF modulated signal to said second access point using a point coordination function (PCF) mode associated with said 802.11x protocol so as to maintain timing compatibility; wherein said multi-antenna signal processing circuit operates with a first baseband processor to receive and transmit RF signals in a channel between said first access point and said second access point.

16. (Original) The method of claim 15, wherein said multi-signal procossor processes data using a high rate direct sequence spread spectrum (HR/DSSS) physical layer frame structure that has a preamble and header compatible with said 802.11x protocol.

17. (Original) The method of claim 16, wherein said header includes additional data to identify a high rate mode.

18. (Original) The method of claim 16, wherein said header includes additional data to identify a modulation format.

19. (Original) The method of claim 15, wherein said multi-signal processor generates a dummy response signal to said second access point to mask a latency associated with decoding a received data packet.

20. (Original) The method of claim 15, wherein said channel mixing matrix is blindly estimated using a Herault-Jutten network.

21. (New) A method comprising:

establishing a communications channel between a first access point and a second access point;

monitoring transmission conditions in the communications channel;

determining whether a first transmission mode or a second transmission mode should be used;

performing a first set of signal processing operations at the first access point on a received signal from the second access point when the first transmission mode is used; and

performing a second set of signal processing operations at the first access point on M independent received signals from the second access point when the second transmission mode is used.

22. (New) A method according to claim 21, further comprising:

automatically enabling the second mode when transmission conditions indicate that a data rate in the channel has fallen below a predetermined threshold.

23. (New) A method according to claim 21, further comprising:

enabling the second mode when transmission conditions indicate that a data rate in the channel will be enhanced above a nominal operating rate.

24. (New) A method comprising:

performing data transmissions during a first operating mode in a channel at a first access point;

performing data transmissions during a second operating mode in the channel at a first access point;

receiving M independent modulated input signals from a second access point;

processing the M independent modulated input signals;

extracting N independent data signals transmitted by the second access point;

selecting the first operating mode and the second operating mode based on a transmission condition in the channel.

25. (New) A method according to claim 24, further comprising separating signals from different directions simultaneously, or nearly simultaneously, in a multi-antenna signal processing circuit.

26. (New) A method of operating a selective wireless data processing system comprising:

monitoring at least one channel condition between two or more wireless access points;

determining whether a threshold has been met for noise, interference, frequency fading, data rate and/or operating range on at least one channel between two or more wireless access points;

responding to channel conditions; and

demodulating N separate data signals from M separate antennas simultaneously when channel conditions reach the threshold.

27. (New) An apparatus comprising:

means for establishing a communications channel between a first access point and a second access point;

means for monitoring transmission conditions in the communications channel;

means for determining whether a first transmission mode or a second transmission mode should be used;

means for performing a first set of signal processing operations at the first access point on a received signal from the second access point when the first transmission mode is used; and

means for performing a second set of signal processing operations at the first access point on M independent received signals from the second access point when the second transmission mode is used.

28. (New) An apparatus according to claim 27, further comprising:

means for automatically enabling the second transmission mode when transmission conditions indicate that a data rate in the channel has fallen below a predetermined threshold.

29. (New) An apparatus according to claim 27, further comprising:

means for automatically enabling the second transmission mode when transmission conditions indicate that a data rate in the channel will be enhanced above a nominal operating rate.

30. (New) An apparatus comprising:

means for performing data transmissions during a first operating mode in a channel at a first access point;

means for performing data transmissions during a second operating mode in the channel at a first access point;

means for receiving M independent modulated input signals from a second access point;

means for processing the M independent modulated input signals;

means for extracting N independent data signals transmitted by the second access point;

means for selecting the first operating mode and the second operating mode based on a transmission condition in the channel.

31. (New) An apparatus according to claim 30, further comprising means for separating signals from different directions simultaneously, or nearly simultaneously, in a multi-antenna signal processing circuit.

32. (New) An apparatus for operating a selective wireless data processing system comprising:

means for monitoring at least one channel condition between two or more wireless access points;

means for determining whether a threshold has been met for noise, interference, frequency fading, data rate and/or operating range on at least one channel between two or more wireless access points;

means for responding to channel conditions; and

means for demodulating N separate data signals from M separate antennas simultaneously when channel conditions reach the threshold.